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### REMARKS/ARGUMENTS

Claims 1-19 are pending in this application. By this amendment, Applicant amends the Abstract and Claims 1 and 11.

Applicant has amended the Abstract to have less than 150 words as required by 37 C.F.R. 1.72.

Claims 1-4, 6-14 and 16-19 were rejected under 35 U.S.C. § 102(b) as being anticipated by Chiyoma et al. (EP 0 840 369). Claims 5 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chiyoma et al. in view of Yoshinori et al. (EP 0 991 185). Applicant respectfully traverses these rejections.

Claim 1 has been amended to recite:

"A surface acoustic wave device comprising:  
a package having a linear thermal expansion coefficient;  
a plurality of metal bumps; and  
a piezoelectric substrate bonded to the package via the plurality of metal bumps;

**wherein the piezoelectric substrate has different linear thermal expansion coefficients in two different directions of a bonding surface of the piezoelectric substrate on which the plurality of metal bumps are provided; and**

**the maximum distance between the metal bumps arranged in a direction in which the piezoelectric substrate and the package have a greater difference between the linear thermal expansion coefficients is less than the maximum distance between the metal bumps arranged in another direction in which the piezoelectric substrate and the package have a smaller difference between the linear thermal expansion coefficients."** (emphasis added)

Applicant's claim 1 recites the features of "wherein the piezoelectric substrate has different linear thermal expansion coefficients in two different directions of a bonding surface of the piezoelectric substrate on which the plurality of metal bumps are provided" and "the maximum distance between the metal bumps arranged in a direction in which the piezoelectric substrate and the package have a greater difference between the linear thermal expansion coefficients is less than the maximum distance between

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the metal bumps arranged in another direction in which the piezoelectric substrate and the package have a smaller difference between the linear thermal expansion coefficients." Claim 11 recites similar features as claim 1. With the improved features of claims 1 and 11, Applicant has been able to greatly reduce the stress produced in the bonded portion between a surface acoustic wave element and an electronic component package due to temperature changes (see, for example, the last full paragraph on page 3 of the Specification, as originally filed).

The Examiner alleged that Chiyoma et al. teaches that the "piezoelectric substrate 100 (lithium tantalite [sic] page 83 line 6-7) has different linear thermal expansion coefficients located in two different directions" (last full paragraph on page 2 of the Office Action).

On page 83 of Chiyoma et al., referred to by the Examiner, Chiyoma et al. teaches that "36° Y-cut LiTaO<sub>3</sub>" can be used as the piezoelectric material. However, the Examiner has failed to provide any evidence that "36° Y-cut LiTaO<sub>3</sub>" includes the feature of "wherein the piezoelectric substrate has different linear thermal expansion coefficients in two different directions of a bonding surface of the piezoelectric substrate on which the plurality of metal bumps are provided" as recited in Applicant's claim 1 and similarly recited in Applicant's claim 11. The Examiner is reminded that the linear thermal expansion coefficient is dependent upon the cutting angle and the crystal orientation of the piezoelectric material (see, for example, the paragraph bridging pages 11 and 12 of Applicant's originally filed Specification).

The Examiner is hereby requested to cite a reference in support of her position that it was well known at the time of Applicant's invention that "36° Y-cut LiTaO<sub>3</sub>" has the feature of "wherein the piezoelectric substrate has different linear thermal expansion coefficients in two different directions of a bonding surface of the piezoelectric substrate on which the plurality of metal bumps are provided" as recited in Applicant's claim 1 and similarly recited in Applicant's claim 11. If the rejection is based on facts within the personal knowledge of the Examiner, the data should be supported as specifically as

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possible and the rejection must be supported by an affidavit from the Examiner, which would be subject to contradiction or explanation by affidavit of Applicant or other persons. See 37 C.F.R. § 1.104(d)(2).

Further, the Examiner has alleged that Chiyoma et al. teaches the feature of "the maximum distance between the metal bumps arranged in the direction in which the piezoelectric substrate and the package have a greater difference between the linear thermal expansion coefficients is less than the maximum distance between the metal bumps arranged in the other direction in which the piezoelectric substrate and the package have a smaller difference between the linear thermal expansion coefficients" as recited in Applicant's claims 1 and 11. The Examiner has clearly mischaracterized Chiyoma et al.

Chiyoma et al. shows in **Figs. 19-21** that the maximum distance (L1) between the metal bumps is less than the maximum distance (L2) in the other direction. Chiyoma et al. teaches in lines 41-46 on page 86 that it is directed to differences in thermal-expansion coefficients between different elements of a surface acoustic wave device, **NOT** directed to the differences in the thermal-expansion coefficient in a single element, the piezoelectric substrate, as recited in Applicant's claims and 11.

Applicant's claims 1 and 11 recite additional features which the Examiner has completely ignored. Claims 1 and 11 clearly recite that (a) "wherein the piezoelectric substrate has different linear thermal expansion coefficients in two different directions of a bonding surface of the piezoelectric substrate on which the plurality of metal bumps are provided" and (b) "the maximum distance between the metal bumps arranged in the direction in which the piezoelectric substrate and the package have a greater difference between the linear thermal expansion coefficients is less than the maximum distance between the metal bumps arranged in the other direction in which the piezoelectric substrate and the package have a smaller difference between the linear thermal expansion coefficients." However, Chiyoma et al. clearly fails to teach or suggest **any** relationship between the maximum distances of the metal bumps in the two directions

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and the difference in the linear thermal expansion coefficients between the piezoelectric substrate and the package in the two directions, and Chiyoma et al. certainly fails to teach or suggest the relationship recited in Applicant's claims 1 and 11.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1 and 11 under 35 U.S.C. § 102(b) as being anticipated by Chiyoma et al.

The Examiner has relied upon Yoshinori et al. to teach the features of "at least three of the metal bumps are disposed near any of four corners of the bonding surface of the piezoelectric substrate, and at least one of the metal bumps is disposed in the approximate center of the bonding surface of the piezoelectric substrate" as recited in Applicants' claims 5 and 15. However, Yoshinori et al. clearly fails to teach or suggest the features of "wherein the piezoelectric substrate has different linear thermal expansion coefficients in two different directions of a bonding surface of the piezoelectric substrate on which the plurality of metal bumps are provided" and "the maximum distance between the metal bumps arranged in the direction in which the piezoelectric substrate and the package have a greater difference between the linear thermal expansion coefficients is less than the maximum distance between the metal bumps arranged in the other direction in which the piezoelectric substrate and the package have a smaller difference between the linear thermal expansion coefficients" as recited in Applicant's claims 1 and 11.

Accordingly, Applicant respectfully submits that Chiyoma et al. and Yoshinori et al., applied alone or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in claims 1 and 11 of the present application. Claims 2-10 depend upon claim 1, and are therefore allowable for at least the reasons that claim 1 is allowable. Claims 12-20 depend upon claim 11, and are therefore allowable for at least the reasons that claim 11 is allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt

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allowance are solicited.

To the extent necessary, Applicant petitions the Commissioner for a THREE-month extension of time, extending to May 21, 2003, the period for response to the Office Action dated November 21, 2002.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

Date: May 20, 2003



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